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May 24, 1958

VOL. 73 NO. 21 PAGES 321-336

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

FLINT
NATIONAL SCIENCE FAIR
A Flint Golden Milestone Event
The Inquiring Mind is Never Satisfied with Things as They are

Ninth Science Fair

See Page 325

A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

Life-Supporting Planets

At least a hundred million planets suitable for life, Dr. Harlow Shapley finds, and many of them are likely to be inhabited by sentient organisms superior to man.

➤ THERE ARE at least a hundred million planetary systems suitable for life in the universe.

Many of these others planets are likely to be inhabited by living, thinking beings equal or superior to man in capabilities.

So suggests Dr. Harlow Shapley, retired director of Harvard College Observatory, in his book, "Of Stars and Men." (See SNL, May 17, p. 316.) The world-famous astronomer has re-examined man's place in the universe in the light of recent developments in many fields of science. Man can no longer consider that he is unique in the cosmos nor that he is at the universe's center.

Dr. Shapley has drawn not only upon his knowledge of astronomy but also of biochemistry, biology, chemistry, geology, mathematics, paleontology and physics.

He concludes that the new discoveries about life, matter and space are "ego-shrinking revelations," and outlines some steps man can take in adjusting to these new facts. Dr. Shapley's essay is "an attempt to build from rough materials a rational and stable structure that contains man and his universe."

Human beings, Dr. Shapley points out, live on the surface of planet number three, in the family of a run-of-the-mill yellowish star, situated in the outer part of a typical galaxy that contains billions of typical stars. This "home galaxy," the Milky Way, is only one such star system among many billions in the known universe.

Life evolved on earth because certain conditions were within the tolerable limits. These conditions are not exclusive to the earth, Dr. Shapley concludes. They could occur wherever a planet was located at the right distance from a star to provide the water and warmth that living organisms require.

Not only is the earth's sun ordinary, but there is undeniable evidence that the kind of physics and chemistry known on earth holds throughout the universe. Further there are more than one hundred thousand million billion stars.

Even after making the most drastic assumptions limiting the number of planets suitable for life so that only one star in a million million qualifies, Dr. Shapley finds there are at least a hundred million planetary systems suitable for life.

This conclusion naturally leads Dr. Shapley to suggest that human beings may be surpassed in intellectual achievements by higher sentient organisms on other planets.

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PUBLIC HEALTH

Exercise for Long Life

➤ IF AMERICANS are to live longer, they have to get more exercise as children, Dr. Kaare Rodahl, Lankenau Hospital, Philadelphia, told a hospital research conference on maturing man.

"What a man is able to do at 70 years of age depends largely on what he did at seven," the physical fitness expert said.

If children walked to school instead of taking school buses, it would be a step in the right direction. Hiking, running, tennis and jumping are good for children, and golf is a good sport because it promotes a bit of outdoor life among adults.

Studies show Alaskan Eskimos, who work and play in sub-freezing temperatures as a matter of necessity, have three times as much stamina as U. S. airmen.

"In this country, people just don't use their feet," Dr. Rodahl declared. There is little choice in this automobile-jammed land, because there is hardly room to walk or to ride bicycles in heavy traffic.

"It is safer for me to fly to the North Pole, as I have done many times, than to cross the City Line Avenue in front of this hospital," he said.

Norway-born Dr. Rodahl favors skiing and swimming for keeping fit, and believes that boxing has absolutely no place in a physical fitness program since the human head was not intended to be a target for blows.

There should be a return to the cultural ideas of ancient Greece, where the same man who was honored as a writer or artist could be expected to wear the Olympic laurel, he concluded.

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NUTRITION

Change in Activities Affects Metabolism

➤ THE MAN who spends three hours playing 18 holes of golf burns up 370 more calories than does the man who gardens for the same amount of time, three experts in nutrition have found.

Basic cause of overweight is consuming calories in excess of the body's needs. Small increases in the amount of food eaten coupled with small decreases in work output can, over a period of time, be responsible for excess weight, Dr. Herbert Pollack of the New York University Post-Graduate School of Medicine, reports in the *Journal of the American Medical Association* (May 10).

Each person has his own "basal caloric requirement," the number of calories needed merely to stay alive. This number is based on the individual's age and body surface area. Also, the calorie expenditure per body area can be calculated. A difference of almost nine calories an hour for each square meter of body surface between sitting quietly and standing quietly has been found.

When a small calorie count such as this is multiplied by the total minutes during the day, the amount is large, Dr. Pollack reports. If an individual fails to reduce his caloric intake as he ages and decreases his activity, he will gain weight.

This could happen to a girl who switches from a standard to an electric typewriter. A girl five feet three inches tall, weighing 120 pounds, would "save" 450 calories per week with an electric typewriter. During a period of weeks, this "saving" would increase body weight if her food intake remained constant.

C. Frank Consolazio and Gerhard J. Isaac, both of the Army Medical Nutrition Laboratory, Fitzsimons General Hospital, Denver, Colo., collaborated in the study.

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MEDICINE

Injected Bone Marrow May Develop Cancer

➤ BONE MARROW injected into mice to protect them from deadly doses of radiation sometimes develops into cancer that kills the mice it was meant to protect.

This finding was reported to the American Association for Cancer Research meeting in Philadelphia. The studies of long-lasting bone marrow effects were made by Miss Delta E. Uphoff and Dr. Lloyd W. Law of the National Cancer Institute, Department of Health, Education, and Welfare, Bethesda, Md.

Their work followed studies reported several years ago by National Cancer Institute scientists who found mice exposed to lethal doses of total-body radiation, about 900 roentgens, recovered from the effects of acute radiation injury when bone marrow was injected intravenously.

Later studies showed that if the irradiated mice receive bone marrow from the same mice strain, they survived one to two years, somewhat shorter than the normal lifespan. Injected with bone marrow from a different strain, however, many mice died in 21 to 90 days, although they survived the stage of acute radiation damage.

Those that survived more than 90 days developed tumors. Miss Uphoff and Dr. Law undertook to find out whether the tumors of the blood-forming organs came from the cells of the host animal or the bone marrow injection.

Most of the tumors were due to the bone marrow injections from a different mice strain.

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ASTRONAUTICS

Moon Shots Scheduled

Five attempts will be made beginning late this year to put rockets near or land them on the moon. The first vehicles may be sent past it.

➤ FIVE "SHOTS" past, around, or on the moon will be attempted by the Army and the Air Force beginning sometime late this year.

Authorization for the moon probes has been given by the Advanced Research Projects Agency of the Department of Defense for two launchings by the Army and three for the Air Force. What will be learned from the moon explorations was outlined at a press conference following a closed session of the Symposium of Possible Uses of Earth Satellites for Life Sciences Experiments held in Washington.

Present thinking and planning, representatives of the Army and Air Force projects said, is that vehicles will be sent past the moon first, rather than around the moon in orbit or landed on the moon itself.

Instrumentation for the Air Force vehicle to probe the moon will possibly include a magnetometer to determine whether or not the moon has a magnetic field, a device to measure the depth of radiation surrounding the moon, if any, and a mechanical photo-scanning device similar to a simple television camera being developed by the Navy, Dr. Albert R. Hibbs of the Jet Propulsion Laboratory, California Institute of Technology, said.

One of the very important scientific problems that could be solved by sending a vehicle past the moon would be to determine the actual distance from the earth to the moon and how much the moon really weighs. Earthbound figures, Dr. Hibbs said, are currently in error by one percent, which is enough to make a manned landing attempt on the moon very hazardous. He said every precaution is being taken to ensure that anything landed on the moon will be sterilized enough not to contaminate the moon for future biological experiments. The Russians are being consulted on this and Dr. Richard W. Porter, head of the rocket and satellite panel of the IGY, said that the Soviet Academy of Science is as concerned about moon contamination as are American scientists.

The problem, the scientists noted, is that even putting a "small package" on the moon could mean the introduction of virus particles or bacteria from the earth and interfere with the accuracy of biological information that may be gathered. There was doubt expressed by Dr. Porter that life exists on the moon.

But, he added, this does not rule out the possibility altogether and even speculated that there might be viruses existing there as "dormant" molecules.

Scientists have also revealed that they will have to concern themselves with the contamination problem on return trips from Mars or Venus. They hinted that returnable missiles from either of these planets could introduce something on the earth. They indicated that the same was not true for the moon.

Sterilization of satellites or missiles to the moon could be accomplished in a number of ways. The scientists pointed out that the friction of the air would make the satellite or missile skin sterile and the inside could be "fumigated prior to launching."

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GEOPHYSICS

Instruments for Satellites

➤ UNITED STATES satellites, although smaller than the Russian sputniks, will pack as much scientific punch.

The reason is that the U. S. is undertaking scientific experiments that the Russians have not.

This is true despite the fact that the third Red giant weighs one and a half tons. It began circumnavigating the earth on May 15 and is designed to send back the results of nine distinct kinds of information about nearby space.

Dr. Richard W. Porter, chairman of the U. S. rocket and satellite panel for the International Geophysical Year, said there were two experiments planned by the U. S. not being accomplished by the sputniks.

These both involve information about the weather. One planned project for a sophisticated American moon is designed to send back a picture to show how much of the earth is covered by clouds. This will give earthbound weathermen information never before available. From it they expect to be able to make more accurate weather predictions.

The second planned meteorological project is to measure the earth's radiation balance. By finding the difference between the radiation hitting the earth from the sun and that reflected back by earth into space, weathermen will have their first direct data on the total heat balance of the world.

Dr. Porter also intimated that the Russians may not have received a very good picture of the sun's ultraviolet radiation or X-rays. Luck, he said, plays an important part in gathering this particular information.

X-rays emitted by the sun are believed to show a sharp increase when the sun suddenly erupts in a flare. A satellite must be there and with its radio working to capture this sudden burst of energy.

U. S. scientists are hopeful that their satellites will be in the right place at the right time to get an "interesting" picture of solar X-rays and ultraviolet, which they believe the sputniks have failed to provide.

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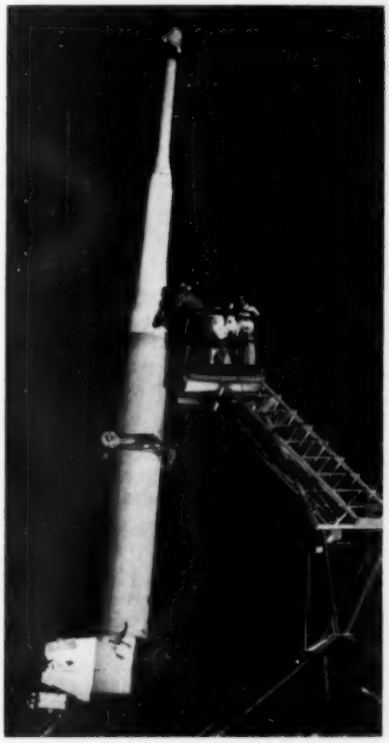

NOSE CONE TEST—The Lockheed X-17 ballistic missile, shown here in a final pre-launching check, has successfully brought more than 20 nose cones back from outer space. They have survived the tremendous heat encountered in re-entry.

PSYCHIATRY

TB Drug Relieves Tendency to Suicide

➤ IPRONIAZID, wonder drug against tuberculosis, can also be used as an anti-depression drug to keep people from committing suicide, Dr. Theodore R. Robie, psychiatrist from East Orange, N. J., reported to the Society of Biological Psychiatry meeting in San Francisco.

The TB drug was used on 70 patients who had been trying so hard to commit suicide they had to be kept under constant supervision, Dr. Robie reported. During the treatment with the drug, no suicides occurred. A high proportion of the patients improved under the treatment.

Patients taking iproniazid must be watched carefully and dosage adjusted if complications arise, but antidotes for some of the complications are available.

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ANTHROPOLOGY

Ancient Skull Puzzles

➤ THE 45,000-year-old Neanderthal skull recently assembled from fragments found in Shanidar Cave in Iraq presents a real scientific puzzle to anthropologists because, although his face was very primitive, the back of his head was more like modern man.

The description of Shanidar Man as a being who appeared to be a totally different creature depending on whether he was seen coming or going was presented to the American Association of Physical Anthropologists meeting in Cambridge, Mass., by Dr. T. Dale Stewart of the Smithsonian Institution.

This is a case where, if less had been found, the problem would have seemed less difficult.

If Dr. Ralph Solecki, also of the Smithsonian, who unearthed the puzzling bones, had found only parts of the ancient face, anthropologists would have been surprised that such a primitive creature should have lived so recently as 45,000 years ago.

If, on the other hand, he had come across only fragments of the back of the head, the anthropologists would have been surprised that Shanidar Man was so similar to modern man.

Putting the tiny pieces together was a super-difficult jigsaw puzzle, but Dr. Stewart reported he was able to fit them together so neatly that he satisfied himself they were all originally parts of the same individual skull.

"The skull belonged to quite a different being from any modern man whose bones I have examined," Dr. Stewart told his colleagues.

Scientists who have in the past studied the bones of Neanderthalers showing a similar mixture of primitive and modern characteristics have theorized that such a creature may have resulted from hybridizing between Neanderthalers and modern man living at the same time.

"But," Dr. Stewart pointed out, "hybridizing just does not result in a creature with the face of one parent and the back of the other."

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CARTOGRAPHY

Date Early Road Maps

➤ HISTORY is hidden within the accordion folds of your road map.

As a matter of fact, the shape of maps has changed little since the early Chinese switched from rolled maps and books, some 30 feet long, to the familiar folded form, pointed out Dr. Richard C. Rudolph, professor of oriental languages at the University of California, Los Angeles.

He has collected 200 Chinese, Korean and Japanese maps during his numerous trips throughout Asia on scholarly and archaeological missions. None is less than 100 years old.

In his collection are maps vividly colored by means of vegetable pigmentation applied through block printing or by hand painting. These maps, which depict battlegrounds, city streets, harbors, countries and the world, are often composed of many separate paper sheets joined together.

One unusual Japanese wood engraving dating before 1824 is so carved that a print made from it appears as an aerial view of all the Japanese Islands with the outline of Korea in the distance. In this "prize of proportion," the mountains, harbors, sailing boats and temples are graphically, not symbolically, represented, thus giving the impression that one is actually seeing all of Japan.

One Japanese map shows California as an island. The Chinese maps have south where European maps have north. Nearly all of the maps are highly decorative, the color printing process often requiring the use of five separate wood engravings.

During the 18th century the Jesuits came to China and the effect of their scientific teachings soon left its mark on the maps of the Orient. The attention paid by the Jesuits to mathematics, geography and astronomy, combined with the existing native artistry, created maps which in shape and accuracy closely resembled today's gasoline station road maps.

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ENGINEERING

River Development Poses Flood Threat in West

➤ HOW DO you control a river that is moving sideways at the rate of three miles every four years?

A river in India, the Kosi, which is about the size of the Colorado River, has shifted 75 miles in the past 100 years. Engineers have been trying to confine it by building levees as was done in the Lower Mississippi. But this is only a stop-gap solution.

Wherever it is, an unstable river channel such as that of the Kosi is likely to be a threat to river bank communities and to bridges and other structures.

What is needed, Dr. L. B. Leopold, chief hydraulic engineer with the U. S. Geological Survey, said, are answers to some basic problems in geology, hydraulics and soil sciences.

We need to know more about what happens when "clear water" from a reservoir is released into a river channel composed of alluvial material, he explained. This clear water is likely to cause the channel to change in depth or position.

The rapid development of rivers, particularly in western United States, will pose problems of this type which engineers will be called upon to solve, warned Dr. Leopold.

It is as a result of channel changes in the Colorado River, controlled by the Hoover Dam system, that a threat of floods exists at Needles, Calif.

Better sampling techniques to compute the debris carried by a stream, and facts on the mechanics of how rivers operate and the nature of water's action on river banks are necessary, Dr. Leopold said. Stream channel engineering — a new technical specialty—was discussed by Dr. Leopold at a meeting of the Washington Society of Engineers.

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GENERAL SCIENCE

Science Fair Winners

Four young scientists, two boys and two girls, were chosen top winners in the ninth National Science Fair. American Medical Association and Armed Forces also give awards.

See Front Cover

➤ HIGH SCHOOL SCIENCE fairs have produced nearly 100 new top rank young scientists who were presented to the nation at the National Science Fair awards dinner in Flint, Mich., on May 9.

A scene from the Fair exhibit hall is shown on the cover of this week's SCIENCE NEWS LETTER.

Judged as having the best exhibits at the national level were four teen-aged finalists. The two top girls were Eileen Jane Settle, 17, a senior at Portland-Wayne Township High School, Portland, Ind., "Insects on Our Farm," and Betty Ann Moore, 17, a junior at Chatham High School, Chatham, La., "Living Sulfates and Elementary Crystallography."

The two top boys were Verne D. Hulce, 16, a sophomore at Lansing Eastern High School, Lansing, Mich., "Nuclear Magnetic Resonance Spectrometer," and Eric Lawrence Rickes, 17, a senior at Rahway High School, Rahway, N. J., "Dutch Elm Disease Research."

Presentation of the awards followed a talk by Dr. Lawrence R. Hafstad, General Motors vice-president in charge of research staff. Watson Davis, director of SCIENCE SERVICE, which conducts the National Science Fair, presided over the dinner that climaxed a close competition between 281 finalists. They represented 146 affiliated fairs in the continental United States, Hawaii, Alaska, Japan and Army Dependents' schools in Germany and France.

Winners Receive Wish Awards

The four first place winners will receive Wish Awards of $125 of scientific equipment or books of their own choice.

Eileen presented an extensive display of insects, collected over a period of two years on her home farm. Betty Ann, who has been totally deaf since she was eight years old, prepared an exhibit of crystals grown from sulfate and other substances, illustrating the axes of each system.

Verne D. Hulce's project shows nuclear resonance patterns by means of a spectrometer, and Eric Rickes investigated a control method for Dutch elm disease through study of the nutrition of this fungus.

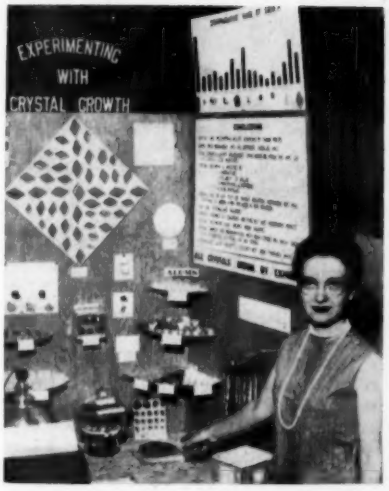
Second honors and $75 Wish Awards went to three girls and eight boys. The girls were Patricia Ernestine Sherman, 17, a senior at Foley High School, Foley, Ala., "Electrophoresis of the Blood of Animals;" Helen Winn Houston, 17, a senior at Baton Rouge Senior High School, Baton Rouge, La., "Plant Parasitic Nematodes;" and Mary Marshall Doyle, 17, a senior at William Fleming High School, Roanoke, Va., "Factors Affecting Regeneration of the Earthworm."

The eight boys were Robert Walker Lynn, 17, a senior at Woodrow Wilson High School, Washington, D. C., "A Study of Melanin Turnover in Tadpoles;" Edward Ganz, 16, a junior at Walter Johnson High School, Rockville, Md., "Electronic Logic Analyzer for Solving Complex Problems in Propositional Calculus;" David R. Brown, 15, a sophomore at St. Louis Park Senior High School, St. Louis Park, Minn., "Humeral Transplants;" Ronald Michael Benrey, 16, a senior at Bronx High School of Science, New York, "Instrumentation of Space Satellites;" Kenneth Merrill Hanson, 18, a senior at Rye Neck High School, Mamaroneck, N. Y., "Precision Electronic Analog Computer;" John David Keich, 18, a senior at Tamaqua Senior High School, Tamaqua, Pa., "Original Sport Plane;" Brian Russel DePalma, 17, a senior at Friends' Central School, Philadelphia, Pa., "Critical Study of Hydrogen Quantum Mechanics Through Cybernetics," and Barrie Logan, 18, a senior at Stephen F. Austin High School, Austin, Texas, "Isolation of a New Growth Stimulant."

Third Award Winners

Winners of the third award and $50 Wish Awards also went to three girls and eight boys. The girls were Margaret Jane Harvey, 17, a senior at San Bernardino High School, San Bernardino, Calif., "Effect of Low Temperatures on Uredospores of Wheat Rust;" Julia Berg Freeman, 17, a senior at Thomas Carr Howe High School, Indianapolis, Ind., "Oxygen for Space—Produced as You Go;", and Ann Elizabeth Pflug, 17, a senior at New Bedford High School, New Bedford, Mass., "Prime Numbers."

The eight boys were Alan E. Hill, 18, a senior at Sweetwater High School, National City, Calif., "Magnetic Thermonuclear Chamber;" Lawrence Moser Breed, 17, a



BETTY ANN MOORE—One of the top four Science Fair winners, Betty Ann has been deaf since she was eight. Her exhibit here shows that all crystals of a substance are alike.

ERIC LAWRENCE RICKES—This top young Fair winner indicated his concern for stopping the spread of the Dutch elm disease by attempting to find a method of controlling the fungus tree disease.

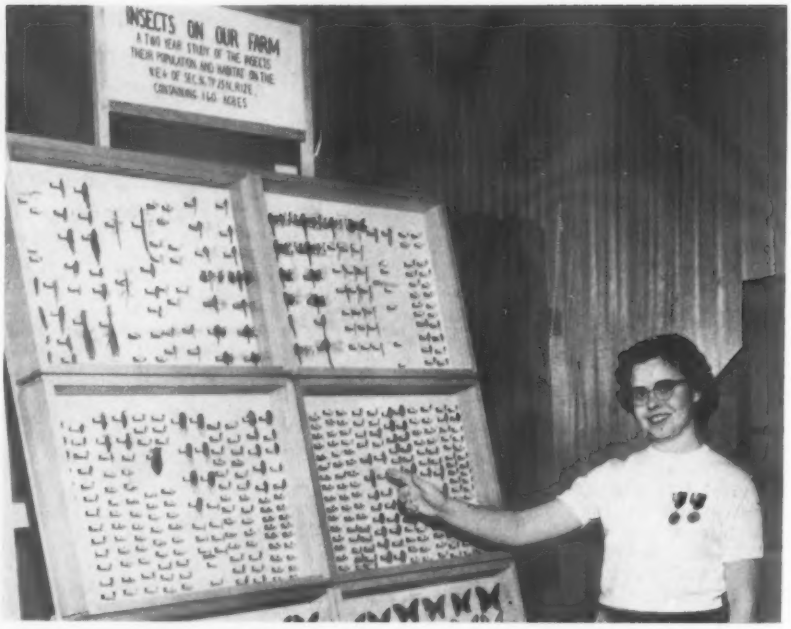
senior at Sidwell Friends School, Washington, D. C., "Four-Dimensional Graphing to Find Complex Roots;" Haven Noble, 16, a sophomore at Davenport High School, Davenport, Iowa, "Solar Motor;" James C. Hartman, 17, a senior at Central Catholic High School, Fort Wayne, Ind., "Titanium —Produced by New Method;" Mel Steinberg, 16, a senior at Lafayette High School, Brooklyn, N. Y., "High Voltage Particle Acceleration;" Michael James Wynne, 18, a senior at St. Louis University High School, St. Louis, Mo., "Ethnobotany of Corn;" Leo G. Morin, 17, a junior at Notre Dame High School, Berlin, N. H., "Axenic Cultures in Medical Research," and Joe York Thomas, 17, a senior at La Porte High School, La Porte, Texas, "Sodium Azide— A Possible Aid in Combating Cancer."

Fourth Place Winners

The fourth place awards, $25 in scientific equipment, in the field of physical sciences were won by the following seven girls: Sybil Eileen Trepanier, Iron Mountain, Mich.; JoAnne Joyce Holbert, Kansas City, Mo.; Eleanor Rachel Weisenhaus, Devils Lake, N. Dak.; Nancy Ruth Barnard, Williston, N. Dak.; Anne Garland Lynch, Oklahoma City, Okla.; Mary Lou Lacy, Martinsville, Va., and Martha Jeanell Halverson, Veradale, Wash.

Fourth awards to boys in physical science fields were won by the following 31: Robert Edward Arnell, Anchorage, Alaska; Vernon Allen Evans, San Bernardino, Calif.; Dean Stewart Ehn, Greeley, Colo.; Lawrence Marvin Gettleman, Miami Beach, Fla.; David Stephen Toback, Coral Gables, Fla.; Alan J. Friedman, Atlanta, Ga.; Leland Brooks Jackson, Atlanta, Ga.; William B. Dress, Jr., Evansville, Ind.; David Paul Eartly, Hammond, Ind.; Larry W. Odom, Wichita, Kans.; George V. Waldo Jr., Sunnybrook, Md.; Peter Richard Samson, Lowell, Mass.; Robert Joseph Seguin, Detroit, Mich.; William Edward Hauda, Sault Ste. Marie, Mich.; William H. Brenner, Bay City, Mich.; Keith Robert Spence, Biloxi, Miss.; Antony P. J. Browne, St. Louis, Mo.; Lindsay LaRoy Hess, Bozeman, Mont.; Paul Blutter, Brooklyn, N. Y.; Arthur Nathan Fankuchen, New York; Barry Schindler, New York; Kriss Leroy Stutzman, Archbold, Ohio; Charles A. Frenzel, Bartlesville, Okla.; Gene Cunningham Jr., Oklahoma City, Okla.; Llewain Scott Van Doren, Sunbury, Pa.; Henry Felix Breit, Warwick, R. I.; Joie Pierce Jones, Abilene, Texas; Gordon Wilson Romney, El Paso, Texas; Paul Corneil, Baytown, Texas; Joel H. Dressler, Arlington, Va., and Paul Edward Webb Jr., Hampton, Va.

In the biological fields, the following 14 girls won fourth place awards: Karen Ann Kjelgaard, Phoenix, Ariz.; Karen E. Reynolds, Marysville, Calif.; Kumiko Nagano, Tokyo, Japan; Joanne Marie Zerger, Salina, Kans.; Sarah Elizabeth Southwick, Midland, Mich.; Jane Marie Earl, Austin, Minn.; Clare L. Chatland, Missoula, Mont.; Diane Jean Davis, Hanover, N. J.; Carol Ann McColm, Farmington, N. M.; Barbara Jeanne Reynolds, Yonkers, N. Y.; Nancy Rebecca Green, Enka, N. C.; Lorraine C. Buzas, Easton, Pa.; Ethel Mae Birch, Willow Grove, Pa., and Linda Ann Lawrence, Germantown, Tenn.



EILEEN JANE SETTLE—Some of the eight boxes of insects, collected during a two-year period, were part of the project for which Eileen was awarded one of the four top places at the Fair.

Boys winning fourth awards in biological fields were: William Paul Boyer Jr., Fayetteville, Ark.; Bing Leat Mah, Modesto, Calif.; Larry Karl Dahlkrist, Palo Alto, Calif.; David M. Jessup, Greeley, Colo.; John D. Friede, Canon City, Colo.; William Albert Dunson, Atlanta, Ga.; Jan Willem van Wagtendonk, Bloomington, Ind.; Thomas Michael Church, Fort Wayne, Ind.; Jon E. Cornell, Wichita, Kans.; Richard Edwin Griffith Jr., Hyattsville, Md.; Jerry Dale Roller, Enid, Okla.; Asa William Bennett, Washington, Ga.; John William Betts, Spearfish, S. D., and James Henry Eley Jr., Austin, Texas.

Other Fair Awards

➤ TOP AWARD winners and their alternates were also announced by judges representing the American Medical Association, and the U. S. Navy, the Air Force and Army.

AMA citations were presented to Clare L. Chatland, 16, a junior at Missoula County High School, Missoula, Mont., and David R. Brown, 15, a sophomore at St. Louis Park Senior High School, St. Louis Park, Minn.

Honorable mention citations from AMA were given to Barbara Ann Conway, 16, a junior at Notre Dame High School, Chattanooga, Tenn., and to Robert LeRoy Sayre, 17, a senior at Vinson High School, Huntington, W. Va.

The two top AMA winners will be guests of the AMA at its annual convention in San Francisco, June 23-27, and their exhibits will be presented with those of eminent doctors and laboratories.

The five young scientists who won Navy science cruises were: Alan J. Friedman, 15, a sophomore at North Fulton High School, Atlanta, Ga.; Edward Ganz, 16, a junior at Walter Johnson High School, Rockville, Md.; Verne D. Hulce, 16, a sophomore at Lansing Eastern High School, Lansing, Mich.; Joe Ed Gaddes, 16, a junior at David Lipscomb High School, Nashville, Tenn., and Joel H. Dressler, 15, a sophomore at Wakefield High School, Arlington, Va.

Their alternates were: David M. Jessup, 17, a junior at Greeley High School, Greeley, Colo.; David Paul Eartly, 16, a junior at Bishop Noll High School, Hammond, Ind.; David R. Brown, 15, a sophomore at St. Louis Park Senior High School, St. Louis Park, Minn.; Keith Robert Spence, 15, a junior at Biloxi High School, Biloxi, Miss., and Luedric D. Harman, 17, a junior at Ponca City Senior High School, Ponca City, Okla.

A special category award was given to Ichiro Matsubara, 18, a senior at Hibiya Senior High School, Tokyo, Japan.

The five Navy Science Cruisers received models of the Navy's CAG-1, the first guided missile heavy cruiser. They or their alternates will take a five-day Navy science cruise in the fall.

Air Force citations were presented to Leland Brooks Jackson, 17, a senior at Southwest High School, Atlanta, Ga., and to Ronald Michael Benrey, 16, a senior at Bronx High School of Science, New York. Their alternates were Dean Stewart Ehn, 16, a sophomore at College High School, Greeley, Colo., and William Eugene Kirchmeier, Jr., 17, a senior at St. Mary's Central High School, Bismarck, N. Dak.

First place winners will be guests at the Air Force Association's national convention and airpower panorama in Dallas, Texas, Sept. 24-28. They received models of the Thor rocket and the alternates were awarded models of a jet fighter.

The U. S. Army science awards winners were: William Albert Dunson, 16, a junior at Northside High School, Atlanta, Ga.; Alden H. A. Fairburn, 17, a senior at Lorain High School, Lorain, Ohio, and Paul Edward Webb Jr., 16, a junior at Hampton High School, Hampton, Va.

Their alternates were: Kenneth Merrill Hanson, 18, a senior at Rye Neck High School, Mamaroneck, N. Y.; Joie Pierce Jones, 17, a junior at Abilene High School, Abilene, Texas, and Robert LeRoy Sayre, 17, a senior at Vinson High School, Huntington, W. Va.

The Army will provide alternate trips to the Jet Propulsion Laboratories in California, the Army Ballistic Missile Agency in Huntsville, Ala., or to the laboratories of Walter Reed Hospital in Washington, D. C.

Many Messages Received

The National Science Fair finalists heard words of praise and encouragement from Government leaders and scientists.

President Eisenhower sent the following telegram:

"TO THE YOUNG SCIENTISTS AND THEIR TEACHERS ASSEMBLED AT THE NINTH NATIONAL SCIENCE FAIR, I SEND GREETINGS.

"THE ACTIVITIES OF THE SCIENCE CLUBS OF AMERICA CONTRIBUTE MUCH TOWARD THE QUALITY AND INTELLECTUAL VIGOR OF OUR YOUTH. THE MAINTENANCE OF OUR LEADERSHIP IN THIS CENTURY OF SCIENCE REQUIRES THE FULL DISCIPLINE OF TRUTH, FREELY EXAMINED AND NOBLY APPLIED.

"IN THIS SPIRIT, IT IS A PLEASURE TO SEND BEST WISHES FOR A SPLENDID SCIENCE FAIR."

Matutaro Shoriki, State Minister and Director of the Japanese Board of Science and Technology, cabled the following from Tokyo:

"MANY THANKS FOR YOUR CORDIAL MESSAGE ON FIRST JAPANESE PARTICIPATION IN NINTH NATIONAL SCIENCE FAIR STOP DEEPLY SATISFIED WITH ACCOMPLISHMENTS OF YOUTHFUL JAPANESE PARTICIPANTS STOP EARNESTLY HOPE THIS WILL LEAD TO DEEPER UNDERSTANDING AND FRIENDSHIP BETWEEN YOUNG GENERATIONS OF TWO COUNTRIES."

The following are excerpts from messages and addresses:

The Honorable G. Mennen Williams, Governor of Michigan—"Every adult and student who has the opportunity of going through these exhibits will wish to be more like you.

"The National Science Fair demonstrates what can be done to develop and expand our American scientific resources without in any way imitating the Soviet Union."

The Honorable Marion B. Folsom, Secretary of Health, Education, and Welfare—"The leadership of those responsible for the National Science Fair deserves particular commendation in this year of renewed interest and concern for our country's efforts in the field of science. This Fair exemplifies the kind of creative thinking so important to the Nation today . . ."

Dr. Lawrence G. Derthick, U. S. Commissioner of Education—"It has been particularly encouraging to note recent figures which show a fairly substantial upward trend in the number of students preparing to be science teachers. I am confident that your work here has contributed materially to this trend, and I wish you every success in this year's fair."

Dr. Ellsworth S. Obourn of the U. S. Office of Education—"Out of you, the young dreamers of today and your dreams, come the scientists, the poets, the artists, the musicians, and the engineers of tomorrow. You are the creative minds of the years ahead. Into your hands will fall the mantle that will contain the challenge to push back further the barriers of ignorance and to discover new truth. On you will rest the well-being of a world that today is fraught with terror and fear. Perhaps in no age has a generation of elders passed on to a new generation a future so crucial."

Dr. L. R. Hafstad, a vice-president of General Motors and in charge of the research staff—"This Science Fair stimulus, however, has another facet which should not be forgotten, something immediate and personal. It is the profound satisfaction of individual effort, of intellectual initiative. And with it, usually goes the sheer thrill of exploration. These Science Fair exhibits are evidence you as participants have experienced this special feeling of satisfaction, and I am sure that you have enjoyed it."

More than 30,000 persons saw the Ninth National Science Fair exhibits and reporters covering the event wired an estimated 40,000 words to their newspapers in addition to telephoned dispatches.

Science News Letter, May 24, 1958

VERNE DE HULCE—Learning about nuclear magnetic resonance using a spectroscope helped Verne to win top honors at the Fair.

GENERAL SERVICE

Science Winners Excel In Logical Thinking

➤ WINNERS of the Science Talent Search conducted by SCIENCE SERVICE are able to think more logically than college graduates, even those with advanced or professional degrees and those with formal training in logic.

This was reported to the Virginia Academy of Science meeting in Roanoke, Va., by Antonia Bell Morgan of Aptitude Associates, Merrifield, Va. Mrs. Morgan reported results of giving the Morgan Test of Logical Reasoning to the top 40 STS winners in the years 1957 and 1958. The mean score of the 80 high school seniors was 40.1.

Tests of other high school seniors resulted in a mean score of only 16.5 for Swarthmore High School in Pennsylvania and only 7.7 for a high school in northern Virginia.

College graduates with a bachelor's degree had a mean score of 28.6. Those with a master's degree had a mean of 30.5. Those with a bachelor's degree or better, plus training in logic, made 29.6. Engineers with a bachelor's degree made 25.8; lawyers with a bachelor's degree, 27.3; and executive potential trainees, 35.4.

Only in the case of the executive potential trainees was the superiority of the Science Talent Search winners not sufficiently great to be statistically significant.

Science News Letter, May 24, 1958

A new eyeglass *hearing aid* operates on free power from ordinary sunlight.

ZOOLOGY

Baby Bees Get Food According to Sex

➤ NURSE BEES in a honey-bee colony "know" just what food to give larvae according to whether the immature forms are destined to become drone, worker or queen.

Fertilized eggs produce either workers or queens; unfertilized eggs, laid in larger cells, produce drones.

Nurses apparently can tell which is which, reports Dr. Mykola H. Haydak of the department of entomology and economic zoology at the University of Minnesota's Institute of Agriculture. The nurse bees recognize the sex no matter what size cell the larva may be in, and this determines what food it receives.

This, Dr. Haydak explains in *Science* (May 9), indicates that, contrary to some earlier theories, sex is the stimulus determining the type of food deposited in the comb cells. Queen larvae receive almost no pollen; a little pollen is found in the food of older worker larvae, and "considerable" amounts of pollen are given to older drone larvae.

In his experiments Dr. Haydak noted, however, that when the queen bee is removed from a colony, the nurse bees cannot seem to differentiate between drones and workers according to sex.

"The cause of this phenomenon is difficult to explain at present," he reported.

Science News Letter, May 24, 1958

GENERAL SCIENCE

Urge Scientific Agencies To Study Arms Plans

➤ SCIENTIFIC AGENCIES should be appointed both by the United States and the United Nations to study modern techniques of weapons control.

In a report on the implications of today's weapons, a special committee of the National Planning Association called for the formation of these scientific advisory agencies as soon as possible. (See p. 332.) The NPA is a nonprofit organization devoted to planning by Americans in agriculture, business, labor and the professions.

Its special committee concluded that agreements on arms control become more difficult to achieve as modern weapons become more complex. The analysis, result of a nine-months' study, assumes that no weapons control will be achieved before 1970 and that the U. S. and Russia will continue their present arms race.

The NPA committee was formed to study the techniques and methods that would be effective in providing arms control, and also to determine the extent to which international agreements to control weapons would lead to greater national security.

The scientific staff recommended by the committee would be attached to the branch of the U. S. Government concerned with disarmament efforts.

The United Nations scientific advisory committee, also recommended by the committee, would provide technical advice on armaments control.

Other findings of the Committee include:

1. The inspection problem will be intensified by development of subversive and unconventional methods of warfare, such as "suitcase" atomic weapons or bombs, which can be carried by saboteurs into enemy countries without detection, and devices for toxicological warfare. Unconventional types of warfare with potentialities for great human destruction are now available even to smaller nations.

2. Nuclear weapons capability will spread to additional powers during the next dozen years. Many nations have the ability to develop nuclear weapons without outside assistance of any sort, but rapid increases of nuclear capability will undoubtedly be accelerated by sharing of information on both military and peaceful uses of atomic power.

3. By 1970, there will be at most a 15-minute warning of attack, resulting in delegation of thermonuclear retaliation decision to lower echelon officers remote from centers of government.

Science News Letter, May 24, 1958

PUBLIC HEALTH

Study Shows Heavy Smokers Live Longer

➤ AMERICAN Tobacco Company employees smoke almost twice as many cigarettes as the general population but live longer and show no more than the average amount of cancer or heart disease.

This was reported by Dr. H. B. Haag of the Medical College of Virginia and H. R. Hanmer, The American Tobacco Company, Richmond, Va., to the Southern Medical Association meeting in Miami Beach, Fla.

The results of the survey directly contradict the theory that smoking causes lung cancer or heart disease.

The tobacco workers were all permanent employees in nine tobacco processing plants. Among white males of The American Tobacco Company group, 77.2% were regular cigarette smokers compared with 49.9% for the general population. For white women, the comparative figures are 44.4% and 23.6%; for non-white men, 84.1% and 48.4%; for non-white women 61.7% and 22.9%.

Previous studies have recorded a statistical association between cigarette smoking and a higher death rate from lung cancer, from heart disease and from all causes combined.

By contrast, this study shows that although the workers smoked more, they had a lower over-all death rate, a lower death rate from cancer and heart disease generally and no higher a death rate from respiratory cancer than is found in the general population.

This makes it evident that cigarette smoking *per se* is not necessarily or always associated with shortened life and a higher cancer risk, the researchers said.

They pointed out that their study was free from estimates or sampling errors since the smoking habits and deaths were tabulated on a virtually complete "head count" basis.

This is not true of other studies relating to smoking and health, they said.

Science News Letter, May 24, 1958

IN SCIENCE

DENTISTRY

Army Tests Jet Injection For Dental Anesthesia

➤ A JET INJECTOR has been used on 60 dental patients who would normally have been anesthetized with a hypodermic needle.

Three Army Medical Service officers found that routine dental operations and surgery could be accomplished painlessly with the injector, which shoots liquid into the tissues at a rate of about 700 feet per second. The power source is a spring-activated plunger.

Besides providing a painless method of anesthetic injection, the method eliminates the possibility of needle fracture and reduces the danger of transmitting infection.

The most serious disadvantage was some bleeding caused by the injector, the Army team reports in the *Armed Forces Medical Journal* (May).

The injector, single-shot and hand-operated, is manufactured by the R. P. Scherer Corporation of Detroit, Mich. The three officers, all lieutenant colonels, are Peter M. Margetis, Dental Corps, in the Army Surgeon General's Office, Washington, Edward P. Quarantillo, Dental Corps, Post Dental Surgeon, Fort Lesley J. McNair, and Robert Lindberg, Medical Service Corps, Walter Reed Army Medical Center, Washington.

Science News Letter, May 24, 1958

BIOLOGY

Listless Turtle Victim of Disease

➤ A PET turtle that pokes along listlessly may not be just turtle-slow. It probably is a very sick reptile.

Students at Southern Illinois University, Carbondale, Ill., working under the direction of Dr. Harold Kaplan, have found the cause of a previously unsuspected disease of turtles. It is a bacterium, *Eschericia intermedium*, commonly found in soil and water.

The bacterium enters the turtles' bloodstream through skin abrasions. Skin ulcers then devolop, the turtle grows listless and eventually dies.

Because turtle meat is consumed by humans, the bacterium may be a source of some human sickness. Inoculations from diseased turtles were fatal to guinea pigs, rabbits and mice.

The high antibody production characteristic of humans, however, gives infected persons excellent recovery chances, Dr. Kaplan reported. The bacterium is described as "very infectious to all species in all seasons."

The organism is killed at about 170 degrees, so thorough cooking of turtle meat is suggested as one way of avoiding infection.

Science News Letter, May 24, 1958

CE FIELDS

FORESTRY

Hemlock Well-Suited To Future Woodlands

➤ THE HEMLOCK grove may soon become a familiar sight to Americans in almost every part of the country as a result of research conducted at the Connecticut Agricultural Experiment Station, New Haven.

Dr. Jerry S. Olson and other scientists at the Station have been studying Eastern hemlock with a view toward increasing woodland productivity, recreation areas and watershed protection. It is "a tree of promise for the future."

Because of its shade tolerance, hemlock is one of the few trees that can be planted in established woodlands. It is important in wildlife conservation, in addition to being an evergreen with "high esthetic value."

As part of the study, Eastern hemlock seed was collected from more than 60 sources ranging from Nova Scotia to Minnesota and along the Appalachians as far south as Alabama. This is the area where the tree commonly grows.

Major experimental plantings of 500 to 800 trees grown from this seed were made in Connecticut, Tennessee, North Carolina, Wisconsin, Massachusetts and Illinois. Smaller plantings were made in Florida, Alabama, Virginia, and in the provinces of Quebec, New Brunswick and Nova Scotia.

These plantings will give important information on hemlock's ability to withstand extreme climatic conditions and on the relationship between genetic differences and a tree's survival and growth. Nurserymen should benefit from the scientists' experiments on effects of temperature and light.

Science News Letter, May 24, 1958

CARDIOLOGY

Heart Stimulant Harmful For Hypothermia Patients

➤ A POTENTIAL but avoidable hazard for patients undergoing cardiac surgery at lowered temperature has been found.

Adrenalin is ordinarily used to stimulate the heart, but it has been found that adrenalin depresses the heart when used in combination with the heart tonic, digitalis, coupled with hypothermia, lowered body temperature.

Patients about to undergo heart surgery have been treated with digitalis before lowering their body temperature. This has been shown to prevent the heart failure that is a major threat in heart operations performed at lowered body temperatures.

Adrenalin-like drugs are also commonly used in low blood pressure emergencies such as shock that sometimes develop during surgery.

Experiments showed that as the body temperatures of digitalis-treated dogs were lowered, the effects of the adrenalin-like drugs were blocked. At 86 degrees, the drugs caused a measurable decrease in the force of heart muscle contractions.

At normal body temperatures, the heart stimulant effects of the adrenalin-like drugs were not affected by the digitalis, Dr. Theodore Cooper and Marion Cotton, pharmacologist, of the National Heart Institute, Bethesda, Md., reported.

The heart stimulants studied included adrenalin and four of its close chemical relatives: nor-adrenalin, isoproterenol, ephedrine and phenylephrine.

Hope for the low blood pressure patients may come from preliminary studies with methoxamine, a blood pressure-raising drug that does not appear to be blocked by digitalis.

Dr. Cooper said more research is needed to determine the performance of various drug combinations under conditions of hypothermia.

Science News Letter, May 24, 1958

NUTRITION

Expectant Mothers Eat Coal at Night

➤ SNEAKING a few nibbles of coal in the middle of the night is just one of the strange appetites of pregnant women, recorded by nutrition experts J. M. Harries and T. F. Hughes, British Ministry of Food and Agriculture, London.

They noted the cravings of 1,000 mothers-to-be and found 187 of them had a great longing to eat some coal. Many admitted it was quite a job to keep their bizarre appetites secret from their husbands. Sometimes the desire became so strong they sneaked out at night to satisfy it.

One expectant mother wanted to eat the plaster off the wall, and 17 out of the thousand felt they had to eat mustard, pepper, salt and spices.

Most popular among the stork set was the more reasonable desire for fruit. Oranges, apples, tomatoes and lemons were highest on this list.

A somewhat similar craving was for vegetables and, of the 105 who had this urge, 72 insisted that they had to be eaten raw. Another 48 longed for cereals, such as rice and oats, and they also insisted on eating the food uncooked.

Huge helpings of pickles were wanted by nearly 70 of the expectant mothers.

The strange cravings are believed due to some deficiency of a mineral or vitamin brought about by the extra demands of childbearing, although a few of the thousand experienced the reverse. They reported developing a strong dislike for some foods they normally liked. Coffee and tea were the commonest among these.

No set pattern was found for the cravings. Some mothers with several children said they had craved the same substance with each baby. Others said they experienced a different longing each time.

Several mothers reported that smoking became distasteful to them when they were expecting a baby.

Science News Letter, May 24, 1958

PSYCHIATRY

Drop in Sensory Signals Causes Hallucinations

➤ HALLUCINATIONS start when sensory signals to the brain fall below a certain minimum.

This happens to the sleeper, and the visions he "sees" are called dreams. It can happen to the driver on a monotonous super-highway, and it then is called "highway hypnosis." It happens to the mental patient who withdraws himself from reality. It can happen to the mystic who deliberately withdraws his attention from his surroundings.

This theory was presented to the American Psychiatric Association meeting in San Francisco by Dr. Louis Jolyon West of the University of Oklahoma School of Medicine, Oklahoma City.

Human brains, he said, are normally constantly bombarded by many signals from the senses. Concentration requires excluding most of these from awareness.

A certain minimum level of sensory signals coming in is necessary to prevent the emergence of signals coming from within the brain itself. The brain-born signals are based upon previous experience and normally serve to set in motion the exercise of memory.

When the sensory input from the surroundings is cut off or lowered, previously recorded perceptions are released. These are hallucinations.

The individual mind of each person weaves them into patterns, scenes or stories.

Science News Letter, May 24, 1958

AGRICULTURE

Rice Disease Attacks Florida Crops

➤ RICE FIELDS in the United States are threatened by a new plant disease.

"Hoja blanca," the Spanish name for the disease meaning "white leaf," had been reported earlier in Cuba and Venezuela where it cut rice yields as much as 75%. It was first observed in Florida in August, 1957.

The problem in combating the disease in this country will be finding commercially desirable varieties of rice that are also resistant to it.

All the more widely grown United States rice varieties are susceptible to "hoja blanca," U. S. Department of Agriculture scientists have reported. Most of the resistant varieties came from Japan, China or Korea or had been cross-bred with these varieties. When the USDA's rice collection was tested for resistance, strains that had the resistant variety Lacrosse as one "parent" were also resistant, indicating that it should be possible to obtain hoja blanca resistant rice.

While the cause of the disease is not known, its symptoms—white stripes on the leaf blade, reduced plant height, missing or sterile flower parts—are similar to those of the stripe disease in Japan. Because of this, scientists have assumed "hoja blanca" is also caused by an insect-transmitted virus. Leafhoppers may spread the disease.

Science News Letter, May 24, 1958

ASTRONOMY

Saturn and Jupiter Visible

Three bright stars now seen in the eastern sky will become even more prominent in upcoming months. June 21 marks official beginning of summer in Northern Hemisphere.

By JAMES STOKLEY

➤ BRILLIANT JUPITER, to the south, and Saturn, conspicuous although it is less than a sixth as bright, are two of the principal objects seen in the June evening sky. Both of these planets are shown on the accompanying maps, which depict the heavens as they look about 10:00 p.m., your own kind of standard time (add one hour for daylight saving time) at the first of June, or an hour earlier at the middle of the month.

The stars are the background against which the man-made earth satellites can be seen as they flash briefly across the heavens.

Jupiter is in the constellation of Virgo, the virgin, and just above the brightest star in that group, Spica. On the astronomical brightness scale, Spica is classed as magnitude 0.9, but Jupiter is now minus 1.8, which is about 12 times as bright. Saturn, in Ophiuchus, the serpent-bearer, is of intermediate brightness, with magnitude 0.2.

A little to the right of Saturn you will see Scorpius, the scorpion, with Antares, a bright star that is distinctly red in color. And over in the west, to the right of Virgo, stands Leo, the lion, with Regulus and Denebola. Low in the northwest, parts of Gemini, the twins, and Auriga, the charioteer, are still visible. Pollux and Capella, first magnitude stars in these groups, appear much fainter because they are close to the horizon and there is so much absorption of their light by the earth's atmosphere.

Bright Stars in East

In the east you will find three bright stars that will become even more prominent during the coming months. These are Vega, in Lyra, the lyre; Deneb, in Cygnus, the swan, which is just below Lyra; and Altair, in Aquila, the eagle, to the right of Cygnus.

Another name for the swan is the Northern Cross, which is now seen in a partially inverted position, for Deneb is at the head of the cross.

The Great Dipper, part of Ursa Major, the great bear, stands high in the northwest. Dubhe and Merak, the "pointers" in the bowl of the dipper, are below; if you follow them to the right, you come to Polaris, the pole star, in Ursa Minor, the lesser bear.

The dipper's handle forms a guide to other prominent stars. If you follow its curve, through Alioth, Mizar and Alkaid, toward the south, you come to brilliant Arcturus, in Bootes. Continuing still farther, it brings you to Spica, and Jupiter.

In June, although Mercury is too close to the sun to be seen, Venus and Mars are visible later in the night. Mars comes up about three hours ahead of the sun. Its brightness is almost as much as that of Saturn, and its red color makes it easy to identify. It is now in Pisces, the fishes.

Venus, nearly five times as bright as Jupiter, is in Taurus, the bull, rising about two hours before the sun.

On June 21 the sun will reach its farthest north position for the year. This event, which marks the beginning of summer in the Northern Hemisphere, is called the summer solstice. It occurs at 4:57 p.m., EST. At that moment the sun will be directly over a point in the Pacific Ocean, on the Tropic of Cancer, and some 500 miles northeast of Hawaii.

Jupiter's Motion Visible

With Jupiter so close to Spica, a star that occupies a fixed position in the sky, the movement of the planet is readily seen.

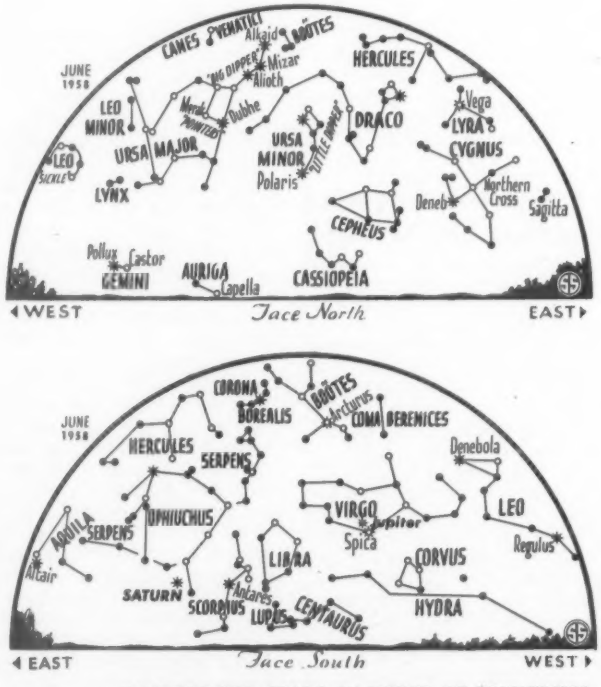
If you have been watching it during recent months, you will have noticed that it has been moving westerly among the stars since Feb. 15. This is called its "retrograde," or backward, movement. Actually Jupiter, like the earth and all the other planets, is going around the sun in the same direction, which is from the west to the east. But the nearer a planet is to the sun, the higher the speed. The earth's mean velocity in its orbit is 18.5 miles per second, compared with 8.1 mps for Jupiter.

Since February, both earth and Jupiter have been in about the same direction from the sun. With the earth's greater speed, it has pulled past the outer planet, however. Viewed against the background of distant stars, therefore, Jupiter has seemed to move backwards, toward the west. In the same way, if you are traveling on an express train and pass a freight train on the next track, the slower freight may seem to be going the other way, even though actually it is moving in the same direction that you are. On Feb. 15 the earth began to pass Jupiter. By June 19 it will have pulled by and Jupiter will resume its usual, direct, easterly motion among the stars.

Also, the earth is now passing Saturn which is opposite the sun and closest to the earth (839,900,000 miles away) on June 13. Saturn, whose orbital speed is six miles per second, is also moving backward among the stars, as it has been since April 4. On Aug. 24 it will resume its direct or eastward movement.

At this time of year we have the opportunity of catching a fleeting glimpse, in the evening sky, of a prominent constellation which can never be seen completely from most parts of the United States. This is Centaurus, the centaur.

A few of the northernmost stars in this constellation are shown on the map of the



☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

southern sky, just above the horizon. The rest of the group is so far south that it fails to rise at all. The farther south you are, the higher these stars rise, and from southern Florida on June evenings, if it were perfectly clear right down to the southern horizon, you would see two very bright stars in the centaur, Alpha and Beta Centauri.

Sun's Closest Star

Alpha Centauri is famous because it is the sun's closest neighbor in space. Actually it is a double star, consisting of two separate orbs, revolving around a common center of gravity. They have a more distant and fainter companion, which may be a little closer than the bright pair. This is called Proxima.

The distance of the Alpha Centauri system is about 26 million million miles, or 4.3 light years. That is, their light, which travels 186,000 miles every second, takes that many years to reach us. If, in a scale model, the period at the end of this sentence represented the sun, Alpha Centauri would be a colon five miles away!

The centaur, it will be recalled, was a mythological creature with the head and shoulders of a man and the body and legs of a horse. This constellation, on the old star maps, was shown holding a spear which he was using to defend himself from a wolf, represented by the constellation of Lupus, to the left of Centaurus.

The hind legs of the centaur are a very famous group of stars, for these make up the Southern Cross, the constellation Crux. Originally considered part of Centaurus, it is now listed separately. From southern Florida, and the vicinity of Brownsville, Texas, the Southern Cross just rises above the horizon; from Central and South America it comes well up into the sky.

Crux is directly south of Corvus, the crow, a constellation to the right of Spica and a little lower, which is shaped like a ship's mainsail.

Actually, the Southern Cross is not as "good" a cross as our Northern Cross. Four bright stars mark its extremities, but there is no star, as there is in its northern counterpart, to mark the intersection. To people who live in southern countries, it is a symbol of their homeland, and the southern cross appears on the flags of New Zealand and Australia.

Celestial Time Table for June

June	EST	
1	3:55 p.m.	Full moon.
2	12:35 p.m.	Moon passes Saturn.
9	1:59 a.m.	Moon in last quarter.
10	11:08 a.m.	Moon passes Mars.
	midnight	Moon farthest, distance 251,300 miles.
13	6:00 p.m.	Saturn opposite sun and nearest earth, distance 839,900,000 miles.
	9:31 p.m.	Moon passes Venus.
17	2:59 a.m.	New moon.
21	4:57 p.m.	Sun farthest north, summer commences.
24	4:44 a.m.	Moon in first quarter.
25	2:59 p.m.	Moon passes Jupiter.
26	4:00 a.m.	Moon nearest, distance 229,200 miles.
29	6:10 p.m.	Moon passes Saturn.

Subtract one hour for CST, two hours for MST, and three for PST.

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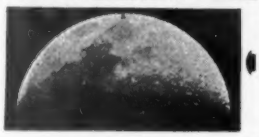

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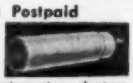

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCES IN CHEMICAL ENGINEERING: Volume II—Thomas B. Drew and John W. Hoopes, Jr., Eds.—*Academic*, 338 p., illus., $9.50. Providing the chemical engineer with critical summaries of recent work.

BASIC CONSIDERATIONS IN THE COMBUSTION OF HYDROCARBON FUELS WITH AIR—Propulsion Chemistry Division, Lewis Flight Propulsion Laboratory—*Govt. Printing Office*, 259 p., graphs, paper, $2.25.

CLINICAL ENZYMOLOGY—Gustav J. Martin, Ed. —*Little*, 241 p., illus., $6. Discussing a new field of medicine.

THE EFFECTS OF RADIATION ON MATERIALS—J. J. Harwood, Henry H. Hausner, J. G. Morse and W. G. Rauch, Eds.—*Reinhold*, 355 p., illus., $10.50. To the layman, the biological effects of radiation are of more immediate concern, but to engineers, physicists and chemists, the effects on materials are of great importance.

ELEMENTARY PRACTICAL ORGANIC CHEMISTRY: Part III Quantitative Organic Analysis—Arthur I. Vogel—*Longmans*, 228 p., illus., $4.50. An elementary text for students and an introduction to the subject for research and industrial chemists.

FRONTIERS OF SCIENCE—Lynn Poole—*McGraw-Hill*, 173 p., illus., $3.25. Explaining new developments and those still under way in science.

GAS DYNAMICS—Ali Bulent Cambel and Burgess H. Jennings—*McGraw-Hill*, 415 p., illus., $11. For the advanced undergraduate and beginning graduate student.

LIVING THINGS—Frederick L. Fitzpatrick and Thomas D. Bain—*Holt*, rev. ed., 416 p., illus., $4.12. An attractively illustrated high-school text for students lacking the capacity for the standard biology course.

LUMBER—Nelson Courtlandt Brown and James Samuel Bethel—*Wiley*, 2d ed., 379 p., illus., $9. Most significant addition to the new edition is a chapter on quality control.

MAN AND NUMBER—Donald Smeltzer—*Emerson Bks.*, 114 p., illus., $2.50. An account of the development of man's use of number through the ages.

MECHANICS—Alexander Efron—*Rider*, 112 p., illus., paper, $1.50. For the general reader or junior college student.

MODERN YUCATECAN MAYA POTTERY MAKING —Raymond H. Thompson—*Soc. for Am. Archeol.*, 157 p., illus., paper, $2.50. A study of modern pottery makes it possible to infer parts of the cultural context of prehistoric pottery in the region.

1970 WITHOUT ARMS CONTROL: Implications of Modern Weapons Technology—NPA Special Project Committee on Security Thorugh Arms Control—*National Planning Association*, 72 p., paper, $1.25. (See p. 328.)

NUCLEAR ENERGY—Alexander Efron—*Rider*, 63 p., illus., paper, $1.25. For students and those in technical positions.

PEPTIC ULCER AND PSYCHOANALYSIS—Angel Garma—*Williams & Wilkins*, 143 p., $6. From the experience of many years of treating different types of ulcer patients, the author has gained an insight into the etiology and psychopathogenesis of peptic ulcer.

PHENOLIC RESIN CHEMISTRY—N. J. L. Megson —*Academic*, 323 p., illus., $10.80. Summarizing original papers from leading workers in the field.

PROCEEDINGS OF THE ACADEMY OF SCIENCES OF THE USSR: Geological Sciences Sections—*Consultants Bureau*, 192 p., illus., paper, single issue $40, $200 a year. In English translation.

PROCEEDINGS OF THE ACADEMY OF SCIENCES OF THE USSR: Section Biochemistry—*Consultants Bureau*, 70 p., illus., paper, single issue $15, $65 a year. In English translation.

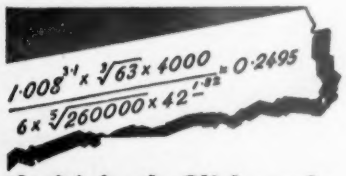
PROGRESS IN ORGANIC CHEMISTRY: 4—J. W. Cook, Ed.—*Academic*, 256 p., illus., $8.80. For the organic chemist who wishes to observe the broad view of the advancing front of his subject.

THE RUSSIAN LITERATURE OF SATELLITES: Part I—D. E. Okhotsimskii and others—*International Physical Index, Inc.*, 181 p., illus., paper, $10. Complete translations of six selected articles from a special satellite issue of the Soviet journal, Progress in Physical Science, Sept., 1957.

WAVE PROPAGATION AND ANTENNAS—George B. Welch—*Van Nostrand*, 257 p., illus., $5.75. Based on a series of lectures first given to sophomores at the Lincoln Institute of Northeastern University.

WHAT'S HAPPENED TO OUR HIGH SCHOOLS?—John Francis Latimer—*Public Affairs Press*, 196 p., $3.25. Report of a four-year study of the needs of our schools.

Science News Letter, May 24, 1958



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PSYCHIATRY

Space Travel May Act as Psychoanalyst's Couch

➤ WHEN HUMANS travel to outer space in manned satellites, they may find the ship acts like the psychoanalyst's couch in releasing material from the unconscious, Capt. George E. Ruff and Capt. Edwin Z. Levy, Wright-Patterson Air Force Base, Ohio, reported to the American Psychiatric Association meeting in San Francisco.

Simulating in the laboratory the stresses of space flight, the investigators found that in the early stages, the individual's characteristic defenses appear in exaggerated form, but few are unable to control the eruption of unconscious material. Later their defenses become more primitive and they reach the limit of their tolerance. Schizoid persons are the first to reach this limit of endurance.

Science News Letter, May 24, 1958

PSYCHIATRY

67% of Hospital Patients Have Psychiatric Illness

➤ MORE THAN TWO-THIRDS of the patients admitted to the medical service of a large city hospital were found also to have a psychiatric illness, a team of doctors from Mount Sinai Hospital, New York, reported at the American Psychiatric Association meeting in San Francisco.

When psychiatric examinations were carried out on 253 unselected patients admitted to Mount Sinai, 66.8% were found to have psychiatric illness. Of these 36.0% suffered from psychoneurosis, 13.7% from character disorder and 5.5% from overt or latent schizophrenia.

Of those admitted for psychosomatic illnesses such as duodenal ulcers, asthma, colitis, etc., 85% had a diagnosable psychiatric illness.

The ward medical staff either did not notice the mental illness of the patients or did not choose to record a psychiatric diagnosis.

The doctors reporting this study were Drs. M. Ralph Kaufman, Samuel R. Lehrman and Stanley Friedman, all of Mount Sinai Hospital.

Science News Letter, May 24, 1958

BIOCHEMISTRY

Find Penicillin Antibody

➤ A PENICILLIN ANTIBODY in the blood has been detected for the first time. Blood serum from certain individuals reacts specifically against penicillin. The newly found antibody, however, does not inhibit the effect of penicillin as would normally be expected.

Discovery of the penicillin antibody is reported in *Science* (May 9) by Dr. Allyn B. Ley, Jean P. Harris, Mary Brinkley, all of the Department of Medicine and Blood Bank Laboratory, Memorial Center for Cancer and Allied Diseases, and Dr. Amos Cahan, Bobbie Liles and James A. Jack, all of the Knickerbocker Foundation, New York.

The antibody was detected during a normal laboratory procedure in the following manner:

Routine blood bank procedure sometimes requires addition of penicillin to blood cell suspensions to be used for testing other blood. Blood from patients about to receive transfusions is mixed with this penicillin-containing blood suspension.

In August, 1957, during a routine blood testing, the test blood of a patient agglutinated, or "clumped," when added to the testing suspension. Usually the penicillin-containing suspension, when mixed with the patient's blood, exhibits no such reaction.

When this particular patient's blood was not exposed to the testing suspension, clumping did not occur.

Further investigation showed that clumping varied directly with the length of time the blood cells were exposed to the penicillin and the degree of penicillin concentration.

Among approximately 2,000 blood serums studied, 25 have reacted to the penicillin-containing suspension. In addition, those individuals with antibody-containing blood all had at some time in the past received penicillin for treatment of some disorder.

This antibody is not related to the penicillin sensitivity that causes skin rash in some patients. However, there is some evidence indicating that the antibody may be related to excessive red blood cell destruction in patients who receive massive penicillin doses in cases of severe infection.

Science News Letter, May 24, 1958

● RADIO

Saturday, May 31, 1958, 1:30-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS radio network. Check your local CBS station.

Mr. Volta Torrey, veteran science editor and director of television, Massachusetts Institute of Technology, Cambridge, Mass., will discuss "Electronic Teaching of Science."

MEDICINE

Study Smoking Habit To Find Substitute

➤ A STUDY is being undertaken to determine why people smoke cigarettes in the hope that the smoking habits of the excessive smoker can be altered and the incidence of lung cancer reduced.

Dr. Daniel Horn, director of program evaluation for the American Cancer Society, said that 10% of the 25,000 lung cancer cases reported yearly could be prevented if heavy smokers could be persuaded to give up smoking.

The big problem now facing the evaluators is to find what motivates the cigarette smoker. If the smoking motives can be discovered, Dr. Horn said, there may possibly be some more suitable substitute which will be less harmful.

If the smoking habits can be changed, the incidence of lung cancer will decline.

Science News Letter, May 24, 1958

TECHNOLOGY

Battery Vest Kept Alive by Body Heat

➤ A POWER SUPPLY that is worn as a vest and kept alive by body heat has been developed for U. S. Army radio operators.

The vest is needed in cold weather operations where the extreme cold normally kills a battery's activity. With the vest, developed by scientists at the Army's Signal Research and Development Laboratory, Fort Monmouth, N. J., batteries to be used in low temperatures are now expected to stay in service ten times longer.

The vest has civilian applications too, the Army hinted. Special pouches in the vest could keep chemicals and drugs warm for explorers and mountaineers.

Test models of the battery garment were built for the Army by Burgess Battery Co., Freeport, N. Y.

Science News Letter, May 24, 1958

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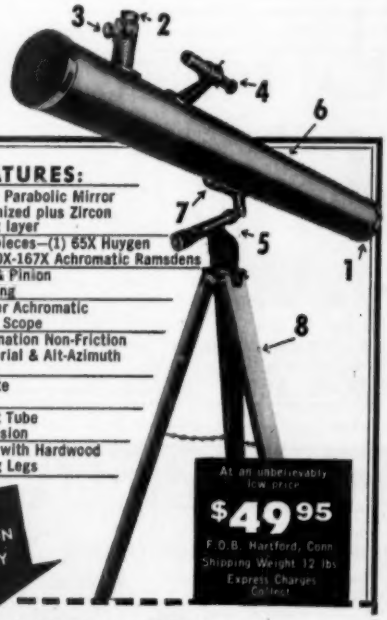

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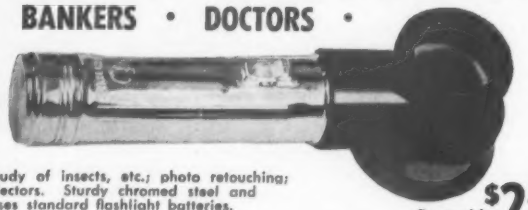

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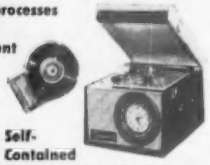

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MISCELLANEOUS

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Questions

AGRICULTURE—How are rice fields in the United States now being threatened? p. 329.

GENERAL SCIENCE—How many planets in the universe are suitable for life? p. 322.

NUTRITION—What are some of the unusual items that pregnant women are found to crave? p. 329.

PSYCHIATRY — How may humans react to space travel? p. 332.

ZOOLOGY—What determines the kind of food received by honey-bee larvae? p. 328.

Photographs: Cover, pp. 325, 326 and 327, Dante Levi for Science Service; p. 323, Lockheed Missiles; p. 336, Sailmaker's Loft.

PSYCHIATRY

Tranquilizers Send Some Patients to Mental Ward

➤ TRANQUILIZERS, taken to treat high blood pressure in some patients are triggering depressions that send them to the hospital for psychiatric care.

This was reported to the American Psychiatric Association meeting in San Francisco by Dr. Robert L. Faucett of the Mayo Clinic, Rochester, Minn. He said 80 such patients have now been seen at Mayo.

However, he said, tranquilizers may not have produced the mental illness since it seems unlikely that any drug could duplicate a complicated psychiatric illness directly. It is more likely that the drug acts to upset an unstable equilibrium of many internal forces.

Science News Letter, May 24, 1958

Do You Know?

Bread mold has been airlifted 20 miles high to test the lethal effects of *cosmic rays.*

Glaucoma, a leading cause of blindness after age 40, is a disease afflicting more than 1,000,000 Americans.

Today, it is more than four times as safe to travel by domestic scheduled *airline* than by automobile.

The National Research Council recommends 55 to 60 grams of *protein* daily for adults and up to 80 to 100 grams for teenagers.

A *solar heating* system of the type that can now be used in American homes in some two-thirds of the nation will pay for itself in less than ten years.

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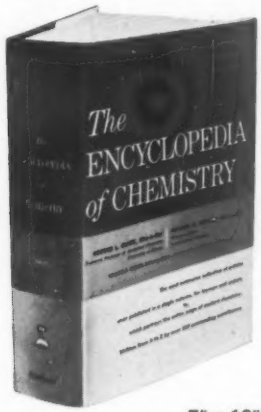

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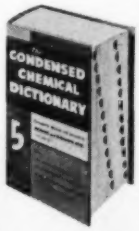

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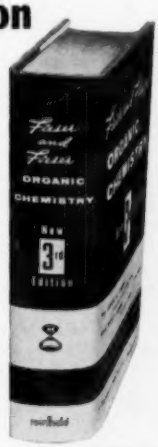

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Science News Letter, May 24, 1958

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⚙ *CANVAS CARRYALL is both water and mildew resistant. It can be used to tote books, athletic equipment, laundry, sundry items, beachwear or overnight clothes. The canvas bag, shown in the photograph, measures 16 inches high and 10 inches in diameter. Available in a wide range of colors, it comes with one four-inch felt letter.*

Science News Letter, May 24, 1958

⚙ *FIRE HOSE REEL from England automatically turns on the water supply as it is unwound. The reel can be housed flush with a wall face and can swing through 180 degrees. Rewinding the hose shuts the water off.*

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⚙ *STRETCHER-LADDER COMBINATION is a British-devised rescue apparatus. Self-contained aluminum-alloy units can be joined together to form a ladder or used singly as either ladder or stretcher. A carrying sheet, included with each unit, permits transfer of an injured person to an ambulance.*

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⚙ *SWIVEL BASE is a light duty adjustable glide designed for the slanted legs on television, radio, hi-fi, dinette and casual tables. The slide has a locking adjustment that permits furniture to be moved for cleaning without changing the caster's adjustment.*

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⚙ *SPACE GRAPH is said to divide any line into an equal number of parts, odd or even, automatically. The graph can also be used to enlarge or reduce, or to give arcs, polygons, pi, square of a circle and other ratios. It is printed on a 9-by-12-inch sheet of plastic.*

Science News Letter, May 24, 1958

Nature Ramblings

By HORACE LOFTIN

▶ A SINGLE LOOK is not enough. It takes that second look to spot the fascinating "tricks" that nature sometimes plays on our eyes. For example, would you say that the daisy, shown in the accompanying picture, is a beautiful flower?"

If you did, you would be wrong.

The object illustrated is not a flower, but a cluster of scores of tiny flowers, grouped together to form what looks like a single large flower. The "petals" you see are individual ray flowers, while the center of the cluster is made up of many tiny disk flowers.

Botanists speak of such a flower cluster as a "head."

This head is typical of the large group of flowering plants called the composites, including the daisies, sunflowers, ragweed and hundreds of others. It indicates, along with some other special characteristics, that these plants are among the highest on the evolutionary scale.

Flower Clusters

The most primitive flower system, supposedly, is the single flower on one stalk. Clusters of flowers, which arrived later in evolutionary time, generally follow one of two patterns.

In the first case, the oldest flowers appear closest to the base of the stem, with the progressively younger ones nearest the tip. Theoretically, there might be new flowers formed as long as the tip kept growing. This kind of flower cluster is called "indeterminate" or "indefinite."

In the other general pattern, the first flower to bloom is at the tip, with the younger flowers appearing lower and lower on the plant. Growth of the stalk is limited by the presence of the oldest flower, and the number of flowers possible then is generally limited to the buds already present. For this reason, botanists call this a "determinate" or "definite" cluster.

The daisy represents a highly advanced stage of the indeterminate cluster. The outer flowers are the first to appear, while the very center ones unfold last. Other types of indeterminate flower clusters are found in the hyacinths, willows, carrots and cherries, to name a few.

Determinate flower clusters can be seen on the crab apple, sweet william, nettles and dogwood.

Science News Letter, May 24, 1958